

IN THE CLAIMS

Claim 1 (Currently Amended): A method of describing object region data about an object in video data including frames arranged in a frame advancing direction, the method comprising:

extracting an object from each of the frames;

approximating the object of each of the frames using one of predetermined figures defined by representative points;

extracting the representative points of the figure for each of the frames, one of the representative points ~~in each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~other the~~ reference point or other of said remaining representative points;

approximating a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, position data about the coordinate value of the reference point;

approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

describing the object region data using the first and second functions.

Claim 2 (Original): The method according to claim 1, wherein said object region data comprises information representing a range of frames in which the object exists in the video data and information identifying the figure approximating the object region.

Claim 3 (Original): The method according to claim 1, wherein said object region data comprises one of information representing related information linking to the object and information representing a method of accessing the related information.

Claim 4 (Previously Presented): The method according to claim 1, wherein said relative position data are components of differential vectors between the one of the representative points and remaining of the representative points.

Claim 5 (Original): The method according to claim 1, wherein said object region data comprises parameters of the functions.

Claim 6 (Currently Amended): A method of describing object region data about an object in video data including frames arranged in a frame advancing direction, the frames including a reference frame and remaining frames, the method comprising:

extracting an object from each of the frames;

approximating the object of each of the frames using one of predetermined figures defined by representative points;

extracting the representative points of the figure for each of the frames, one of the representative points ~~in the reference frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points within said one of the frames being represented by vectors with reference to ~~either the reference point or other of said remaining~~ representative points, and the representative points in the remaining frames being represented by vectors with reference to corresponding representative points in a preceding frame;

approximating trajectories with functions, each of the trajectories being obtained by arranging, in the frame advancing direction, vectors of the representative points; and describing the object region data using the functions.

Claim 7 (Original): The method according to claim 6, wherein said object region data comprises information representing a range of frames in which the object exists in the video data and information identifying the figure approximating the object region.

Claim 8 (Original): The method according to claim 6, wherein said object region data comprises one of information representing related information linking to the object and information representing a method of accessing the related information.

Claim 9 (Previously Presented): The method according to claim 6, wherein said relative position data are components of differential vectors between the representative points in the predetermined frame and the representative points in the succeeding frame.

Claim 10 (Original): The method according to claim 6, wherein said object region data comprises parameters of the functions.

Claim 11 (Currently Amended): A method of describing object region data about an object in video data including frames arranged in a frame advancing direction, the method comprising:

extracting an object from each of the frames;

approximating the object of each of the frames using one of predetermined figures defined by representative points;

extracting the representative points of the figure for each of the frames, one of the representative points ~~in each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~either the~~ reference point or other of said remaining representative points;

approximating a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, data indicating a position of the coordinate value of the reference point; approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

describing the object region data using the first and second functions and depth information of the object.

Claim 12 (Original): The method according to claim 11, wherein said object region data comprises information representing a range of frames in which the object exists in the video data and information identifying the figure approximating the object region.

Claim 13 (Original): The method according to claim 11, wherein said object region data comprises one of information representing related information linking to the object and information representing a method of accessing the related information.

Claim 14 (Original): The method according to claim 11, wherein said object region data is described by using the depth information of the object and parameters of the functions.

Claim 15 (Original): The method according to claim 11, wherein said depth information is a relative depth and has a discrete level value.

Claim 16 (Currently Amended): A method of describing object region data about an object in video data including frames arranged in a frame advancing direction, the method comprising:

extracting an object from each of the frames;

approximating the object of each of the frames using one of predetermined figures defined by representative points;

extracting the representative points of the figure for each of the frames, one of the representative points ~~in each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~other the~~ reference point or other of said remaining representative parts;

approximating a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, data indicating a position of the coordinate value of the reference point; approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

describing the object region data using the first and second functions and display flag information indicating a range of frames in which the object or each of the representative points is visible or not.

Claim 17 (Original): The method according to claim 16, wherein said object region data comprises information representing a range of frames in which the object exists in the video data and information identifying the figure approximating the object region.

Claim 18 (Original): The method according to claim 16, wherein said object region data comprises one of information representing related information linking to the object and information representing a method of accessing the related information.

Claim 19 (Original): The method according to claim 16, wherein said object region data is described by using the display flag information and parameters of the functions.

Claim 20 (Currently Amended): A method of describing object region data about an object in video data including frames arranged in a frame advancing direction, the method comprising:

extracting an object from each of the frames;

approximating the object of each of the frames using one of predetermined figures defined by representative points;

extracting the representative points of the figure for each of the frames, one of the representative points ~~in each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by a relative position data with reference ~~to the reference point or other of said remaining~~ representative points;

approximating a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, data indicating a position of the coordinate value of the reference point;

approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

describing the object region data using the first and second functions and object passing range information indicating a range where the figure approximating the object exist over said plurality of frames.

Claim 21 (Original): The method according to claim 20, wherein said object region data comprises information representing a range of frames in which the object exists in the video data and information identifying the figure approximating the object region.

Claim 22 (Original): The method according to claim 20, wherein said object region data comprises one of information representing related information linking to the object and information representing a method of accessing the related information.

Claim 23 (Original): The method according to claim 20, wherein said object region data is described by using the object passing range information and parameters of the functions.

Claim 24 (Currently Amended): A method of describing object region data about an object moving in a panorama image formed by combining a plurality of frames arranged in a frame advancing direction with being overlapped, the method comprising:

extracting an object from each of the frames;

approximating the object of each of the frames in the panorama image using one of predetermined figures defined by representative points;

extracting the representative points of the figure in a coordinate system of the panorama image, one of the representative points ~~in each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~either the reference point or other of said remaining~~ representative points;

approximating a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, data indicating a position of the coordinate value of the reference point; approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

describing the object region data using the first and second functions.

Claim 25 (Original): The method according to claim 24, wherein said object region data comprises information representing a range of frames in which the object exists in the video data and information identifying the figure approximating the object region.

Claim 26 (Original): The method according to claim 24, wherein said object region data comprises one of information representing related information linking to the object and information representing a method of accessing the related information.

Claim 27 (Original): The method according to claim 24, wherein said object region data comprises parameters of the functions.

Claim 28 (Currently Amended): An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein and for



describing object region data about an object in video data including frames arranged in a frame advancing direction, the computer readable program code means comprising:

computer readable program code means for extracting an object from each of the frames;

computer readable program code means for approximating the object of each of the frames using one of predetermined figures defined by representative points;

computer readable program code means for extracting the representative points of the figure for each of the frames, one of the representative points ~~in each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~either the reference point or other of said remaining~~ representative points;

computer readable program code means for approximating a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, the coordinate value of the reference point;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

computer readable program code means for describing the object region data using the first and second functions.

Claim 29 (Currently Amended): An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein and for describing object region data about an object in video data including frames arranged in a

frame advancing direction, the frames including a reference frame and remaining frames, the computer readable program code means comprising:

computer readable program code means for extracting an object from each of the frames;

computer readable program code means for approximating the object of each of the frames using one of predetermined figures defined by representative points;

computer readable program code means for extracting the representative points of the figure for each of the frames, one of the representative points ~~in the reference frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points within said one of the frames being represented by vectors with reference to ~~other the reference point or other of said remaining~~ representative points, and the representative points in the remaining frames being represented by vectors with reference to corresponding representative points in a preceding frame;

computer readable program code means for approximating trajectories with functions, each of the trajectories being obtained by arranging, in the frame advancing direction, vectors of the representative points; and

computer readable program code means for describing the object region data using the functions.

Claim 30 (Currently Amended): An article of manufacture comprising:

computer readable program code means for extracting an object from each of frames arranged in a frame advancing direction;

computer readable program code means for approximating the object of each of the frames using one of predetermined figures defined by representative points;

computer readable program code means for extracting the representative points of the figure for each of the frames, one of the representative points ~~in each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~either the reference point or other of said remaining~~ representative points;

computer readable program code means for approximating a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, data indicating a position of the coordinate value of the reference point;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

computer readable program code means for describing the object region data using the first and second functions and depth information of the object.

Claim 31 (Currently Amended): An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein and for describing object region data about an object in video data including frames arranged in a frame advancing direction, the computer readable program code means comprising:

computer readable program code means for extracting an object from each of the frames;

computer readable program code means for approximating the object using one of predetermined figures defined by representative points;

computer readable program code means for extracting the representative points of the figure for each of the frames, one of the representative points ~~in each frame~~ within one of the

frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames within said one of the frames~~ being represented by vectors with reference to ~~either the reference point or other of said remaining~~ representative points;

computer readable program code means for approximating a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, the coordinate value of the reference point;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

computer readable program code means for describing the object region data using the first and second functions and display flag information indicating a range of frames in which the object or each of said points is visible or not.

Claim 32 (Currently Amended): An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein and for describing object region data about an object in video data including frames arranged in a frame advancing direction, the computer readable program code means comprising:

computer readable program code means for extracting an object from each of the frames;

computer readable program code means for approximating the object of each of the frames using one of predetermined figures defined by representative points;

computer readable program code means for extracting the representative points of the figure for each of the frames, one of the representative points ~~in each frame within one of the frames~~ being a reference point represented by a coordinate value and remaining

representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~other~~ the reference point or other of said remaining representative points;

computer readable program code means for approximating a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, the coordinate value of the reference point;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

computer readable program code means for describing the object region data using the first and second functions and object passing range information indicating a range where the figure approximating the object exist over said plurality of frames.

Claim 33 (Currently Amended): An article of manufacture comprising a computer usable medium having computer readable program code means embodied therein and for describing object region data about an object moving in a panorama image formed by combining a plurality of frames arranged in a frame advancing direction with being overlapped, the computer readable program code means comprising:

computer readable program code means for extracting an object from each of the frames;

computer readable program code means for approximating the object of each of the frames in the panorama image using one of predetermined figures defined by representative points;

computer readable program code means for extracting the representative points of the figure in a coordinate system of the panorama image, one of the representative points ~~in each~~

~~frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~either the reference point or other of said remaining~~ representative points;

computer readable program code means for approximating a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, the coordinate value of the reference point;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

computer readable program code means for describing the object region data using the first and second functions.

Claim 34 (Currently Amended): A computer data signal embodied in a carrier wave, the computer data signal capable of describing object region data about an object in video data including frames arranged in a frame advancing direction, the computer data signal comprising:

computer readable program code means for extracting an object from each of the frames;

program code portion for causing a computer to approximate the object of each of the frames using one of predetermined figures defined by representative points;

program code portion for causing a computer to extract the representative points of the figure for each of the frames, one of the representative points ~~in each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by

vectors with reference to ~~either~~ the reference point or other of said remaining representative points;

program code portion for causing a computer to approximate a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, position data about the reference point and relative position data about the remaining representative points with reference to the coordinate value of the reference point;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

program code portion for causing a computer to describe the object region data using the first and second functions.

Claim 35 (Currently Amended): A computer data signal embodied in a carrier wave, the computer data signal capable of describing object region data about an object in video data including frames arranged in a frame advancing direction, the computer data signal comprising:

computer readable program code means for extracting an object from each of the frames;

program code portion for causing a computer to approximate the object of each of the frames using one of predetermined figures defined by representative points;

program code portion for causing a computer to extract the representative points of the figure for each of the frames, one of the representative points being a reference point ~~in~~ each frame within one of the frames represented by a coordinate value and remaining representative points ~~in each of the frames within said one of the frames~~ being represented by

vectors with reference to ~~other~~ the reference point or other of said remaining representative points;

program code portion for causing a computer to approximate a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, position data about the reference point in a reference frame and relative position data about the remaining representative points in a succeeding frame with reference to the position data about the coordinate value of the reference point in the reference frame;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

program code portion for causing a computer to describe the object region data using the functions.

Claim 36 (Currently Amended): A computer data signal embodied in a carrier wave, the computer data signal capable of describing object region data about an object in video data including frames arranged in a frame advancing direction, the computer data signal comprising:

computer readable program code means for extracting an object from each of the frames;

program code portion for causing a computer to approximate the object of each of the frames using one of predetermined figures defined by representative points;

program code portion for causing a computer to extract the representative points of the figure for each of the frames, one of the representative points ~~in each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by



vectors with reference to ~~either~~ the reference point or other of said remaining representative points;

program code portion for causing a computer to approximate a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, the coordinate value of the reference point;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

program code portion for causing a computer to describe the object region data using the first and second functions and depth information of the object.

Claim 37 (Currently Amended): A computer data signal embodied in a carrier wave, the computer data signal capable of describing object region data about an object in video data including frames arranged in a frame advancing direction, the computer data signal comprising:

computer readable program code means for extracting an object from each of the frames;

program code portion for causing a computer to approximate the object of each of the frames using one of predetermined figures defined by representative points;

program code portion for causing a computer to extract the representative points of the figure for each of the frames, one of the representative points ~~in each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~either~~ the reference point or other of said remaining representative points;

program code portion for causing a computer to approximate a first trajectory with a first function, the trajectory being obtained by arranging, in the frame advancing direction, the coordinate value of the reference point;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

program code portion for causing a computer to describe the object region data using the first and second functions and display flag information indicating a range of frames in which the object or each of the representative points is visible or not.

Claim 38 (Currently Amended): A computer data signal embodied in a carrier wave, the computer data signal capable of describing object region data about an object in video data including frames arranged in a frame advancing direction, the computer data signal comprising:

computer readable program code means for extracting an object from each of the frames;

program code portion for causing a computer to approximate the object of each of the frames using one of predetermined figures defined by representative points;

program code portion for causing a computer to extract the representative points of the figure for each of the frames, one of the representative ~~in each frame~~ within one of the frames points being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~either the reference point or other of said remaining~~ representative points;

program code portion for causing a computer to approximate a first trajectory with a first function, the trajectory being obtained by arranging, in the frame advancing direction, the coordinate value of the reference point;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining points; and

program code portion for causing a computer to describe the object region data using the first and second functions and object passing range information indicating a range where the figure approximating the object exist over said plurality of frames.

Claim 39 (Currently Amended): A computer data signal embodied in a carrier wave, the computer data signal capable of describing object region data about an object moving in a panorama image formed by combining a plurality of frames arranged in frame advancing direction with being overlapped, the computer data signal comprising:

computer readable program code means for extracting an object from each of the frames;

program code portion for causing a computer to approximate the object of each of the frames in the panorama image using one of predetermined figures defined by representative points;

program code portion for causing a computer to extract the representative points of the figure in a coordinate system of the panorama image, one of the representative points in ~~each frame~~ within one of the frames being a reference point represented by a coordinate value and remaining representative points ~~in each of the frames~~ within said one of the frames being represented by vectors with reference to ~~[[of]]~~ the reference point or other of said remaining representative points;

program code portion for causing a computer to approximate a first trajectory with a first function, the first trajectory being obtained by arranging, in the frame advancing direction, the coordinate value of the reference point;

computer readable program code means for approximating second trajectories with second functions, each of the second trajectories being obtained by arranging, in the frame advancing direction, the vectors of the remaining representative points; and

program code portion for causing a computer to describe the object region data using the first and second functions.